vol. V no. 7
March, 1946

School Shop

FOR INDUSTRIAL ARTS & VOCATIONAL EDUCATION TEACHERS

How Do Students Rate Your Teaching?
by R. Randolph Karch

Project Design
by Howard P. Skinner

Automatic Crossing Signal
by E. A. Rerucha

Dynamic Color for School Shops
by Hayes Quinn

On the cover: Serious students like this young man might help you do a better job of teaching. See page 7 for a description of how to enlist their aid.

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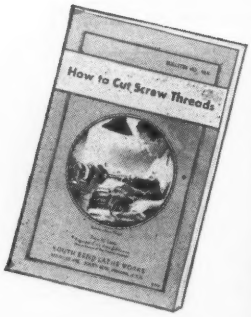

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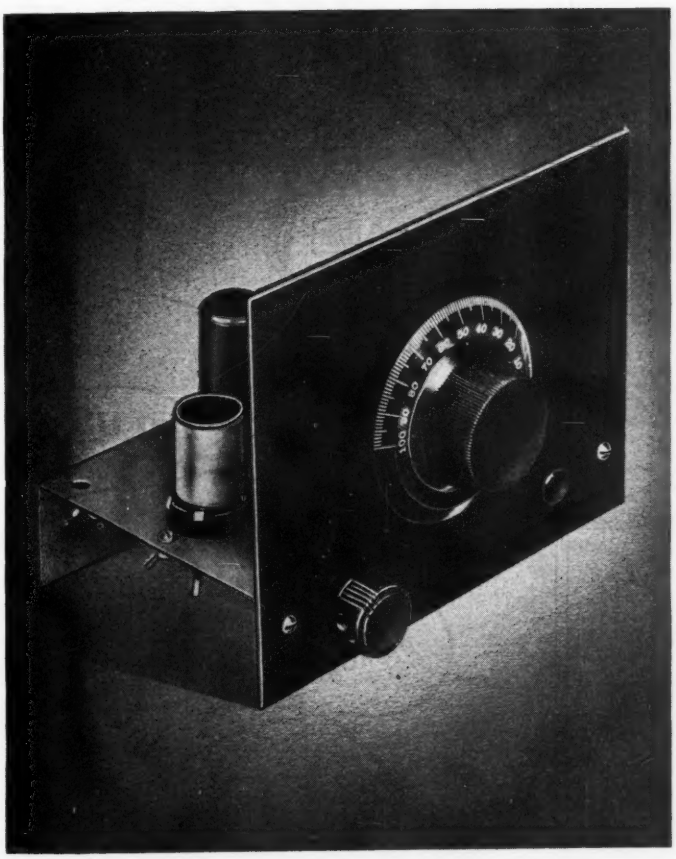

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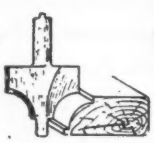

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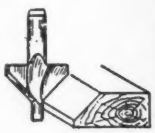

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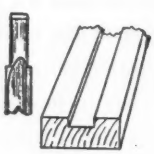

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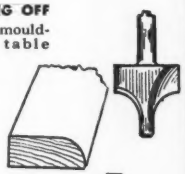

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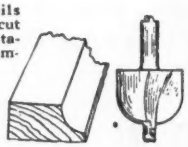

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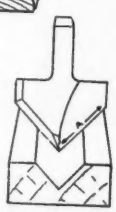

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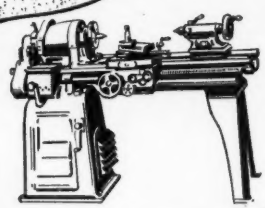

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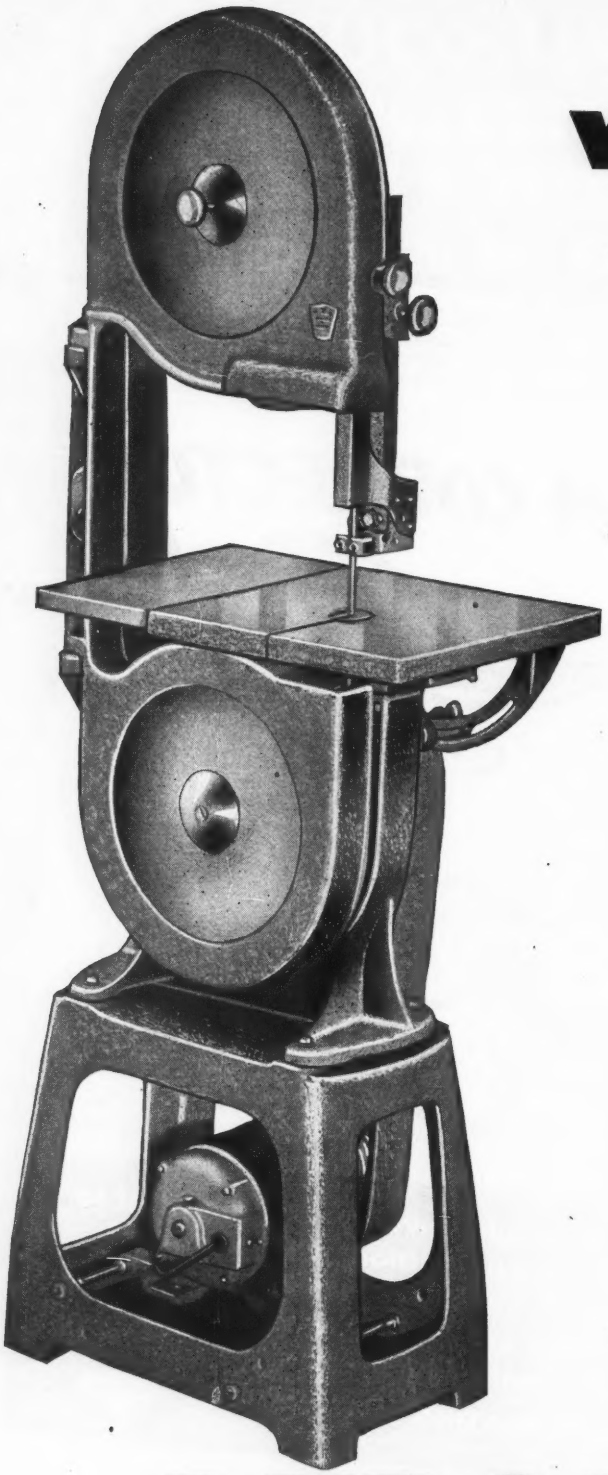

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How Do Students Rate Your Teaching?

BY *R. Randolph Karch*

If you are or want to be a master teacher, you will want to know your students' opinion of your teaching technics. The author, who is on military leave from his position as principal of the Graphic Arts High School, Cincinnati, Ohio, presents a method for doing so.

HOW do you know that you are doing a good job of teaching? Because you think so? Because your supervisor and principal say so?

What do your students think? Your students probably know you better than your overseers do. Have you ever considered the possibility of getting their opinion in an objective way and adjusting yourself to such criticism of merit they may make?

The writer feels he has found an objective way of eliciting student opinion that brings him honest, straightforward, and meritorious criticism. It is in the form of a questionnaire and he submits it here, confident that it will be useful to many instructors in school shops. It has been tried out on thousands of students and if properly administered will give the instructor information on his strong and weak points in teaching.

A tally sheet with columns giving the number of checks for each of the four answers under each question has been found effective. It can be used by the instructor as a picture of himself as he stands before the classroom. It can be used as a comparison with a later tally sheet when the questionnaires are given to the same class several months later. If saved over a period of years, the instructor will be able to determine whether he has improved in those categories where he was noted as weak and whether he has maintained his strong points.

Care must be taken in administering the questionnaire. An instructor will not get honest opinions if he gives a sales talk on his trade background or on his educational qualifications. Nor will he get anywhere if he presents an argumentative front or shows a belligerent attitude.

For the convenience of instructors who would like to try this type of student evaluation, the writer suggests an administrative procedure which he has found effective:

Place the questionnaires on desks before students arrive. After the students are called to attention ask them not to read the paper on their desks until all can read it together. When the class is in proper order, invite the students to read the instructions introducing the questionnaire. Read aloud these instructions. Name a monitor to collect the papers after all have finished. Then go to your desk and sit down and tell the students to proceed. Remain at your desk in a position that prevents your seeing any papers as they are marked. Do not walk about the room while the students are filling in the form. Say nothing. Make no explanations. To any questions simply reply: "Sorry, I can't answer that question." When all have finished, ask the monitor to collect them and to shuffle the papers and bring them to the desk. Maintain an objective attitude throughout.

Here is the questionnaire. The writer has placed in parentheses the objects of the questions. These, of course, should not be used in the questionnaire when it is mimeographed or printed.

The Questionnaire

We need your opinion to help make your instruction the best that you can get. Check the answer to each question that best expresses your own personal feelings about the instruction given in this course. *Do not sign your name.* Feel free to answer frankly and honestly. Make any comments you choose in the space provided. Give this sheet *only* to the student selected when you have completed it. Your instructor will not leave his desk while you are checking this form.

(Assignment)

1. *Did you know just what to do?*
   --I always knew just what to do or study.
   --Sometimes I had to ask the instructor to repeat instructions.
   --I had to ask other students what they thought we should do or study.
   --Nobody ever knew what to do.

(Motivation)

2. *Did you know why the lessons were important?*
   --I knew exactly how each job or lesson applies to my future work.
   --I knew why each job or lesson was important.
   --Once in awhile I wondered why we did a job or studied a lesson.
   --I don't know why we studied the lessons or did the jobs.

(Motivation)

3. *How hard did you try?*
   --I couldn't possibly have tried any harder.
   --I tried fairly hard.
   --I didn't try too hard.
   --I didn't try at all.

(Shop Supervision)

4. *Were you busy?*
   --I was so busy I was surprised when the period ended.
   --Sometimes I had to wait for equipment, tools, or materials.
   --I always had to wait for tools, equipment, or materials.
   --I loafed much of the time.

(Shop Supervision)

5. *Did you get enough help?*
   --I got help every time I really needed it.
   --I got as much help as I expected to get.
   --Sometimes I had to get help from another student.
   --I made too many mistakes because I didn't get enough help.

(Oral Questioning and Discussion)

6. *How were discussions handled?*
   --There was enough discussion and it was kept on the subject.
   --There wasn't enough discussion to clear up questions.
   --I had a hard time keeping awake.
   --We didn't have any discussion—just the lecture.

(Lesson Presentation, Demonstrations, Oral Questioning and Discussion)

7. *Could you hear?*
   --There was never a time when I couldn't hear well.
   --There were times when I couldn't hear.
   --I often found it hard to hear.
   --I seldom was able to hear.

(Same as Foregoing)

8. *Could you understand every word and phrase used?*
   --I understood every word and phrase exactly.
   --Now and then I did not understand a word or phrase.
   --New words and phrases were not always explained.
   --I hardly ever understood.

(Lesson Presentation, Demonstration)

9. *Were the lessons easy to follow?*
   --They seemed very simple.
   --I could follow, but sometimes they were a bit hard.
   --It was a little better than trying to get it from a book.
   --I might as well have read the lesson from a book.

(Testing and Grading)

10. *Did you get a fair deal on grades?*
    --I got just what I earned.
    --I got what I earned most of the time.
    --Half the time I couldn't understand why I got the grade received.
    --The grades didn't make any sense.

(Discipline)

11. *How strictly was the class handled?*
    --Strictly enough to keep order, but not so strict that I was uncomfortable.
    --Strictly enough most of the time, but sometimes the class got out of control.
    --Not strictly enough to keep order—the class made too much noise.
    --It seemed like I was working under a dictator.

(Instructor's Knowledge of Subject Matter)

12. *How much did the instructor know about what he taught?*
    --He is a master of the subject.
    --He knows his subject well.
    --He knows just about enough to get by.
    --He doesn't know much more than the students.

(Personal Qualities of Instructor.)

13. *How did you like the instructor personally?*
    --I would like to know him better.
    --I like him.
    --I don't like him much, but I don't object to having him for an instructor.
    --I don't like him at all.

Additional comments:

Project Design

BY *Howard P. Skinner*

The design element is frequently glossed over when introducing projects to students. Yet design is an important element in industrial education. This article gives some procedures for teaching design fundamentals. Howard P. Skinner teaches in the Marquette, Michigan, schools.

Above—Note the pleasing effect created by applying design principles to the above project.

Below—The steps followed in designing the candlesticks.

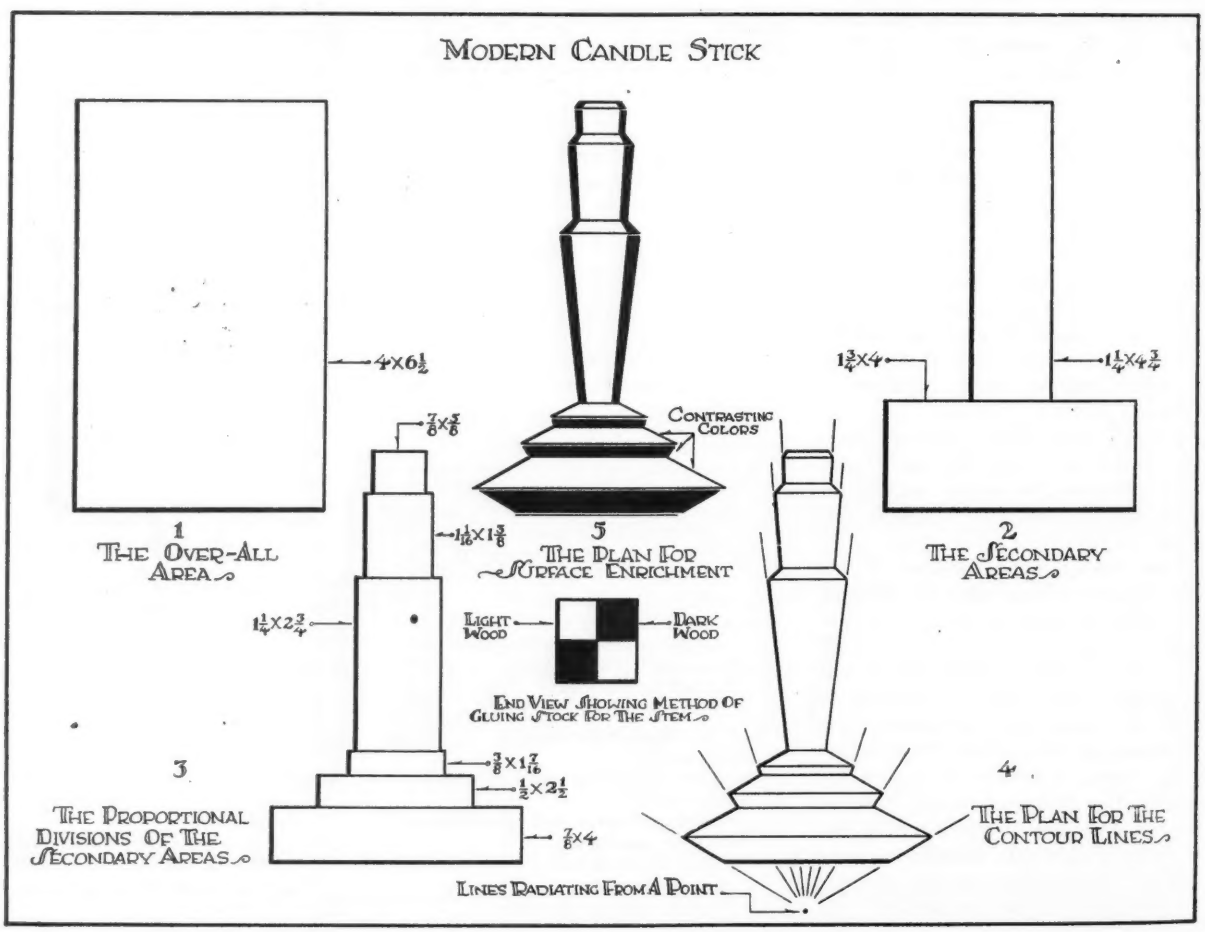
TESTED INSTRUCTIONAL PROJECT

SHOP students of any age may be taught how to create new project designs or to rearrange standard designs in order to produce new and different effects, if a little imagination is developed and if some consideration is given to a few simple rules for handling lines, areas, and surface enrichment.

The main thought to be kept in mind is the fact that a design is not just a simple dimensioned working sketch. It is a detailed plan that includes function, appearance, proportions and dimensions, materials to be used, methods of working the materials, and surface enrichment. All of the items listed here should be carefully analyzed before a design plan may be considered complete. After some thought and planning, students will readily recognize the importance of a good design and will give to that part of their projects the same amount of attention as they ordinarily give to correct construction procedures, cost of materials, proper tool processes, and machine operations.

In planning most designs, the first consideration should be given to the over-all form or area. This over-all form or area usually is in the shape of a vertical or a horizontal rectangle, according to the function of the project. The over-all dimensions and proportions of the project should be included in this area.

The second consideration or step should be the division of the over-all area into the main shapes or parts. These parts may be called secondary areas and should include the secondary dimensions. In this step attention should



be given to both function and appearance.

The third step includes the proportional divisions and the general arrangement of the secondary areas with the emphasis placed on the appearance of the finished project. This step should include most of the detailed dimensions.

When the proportional secondary-area divisions have been determined, the fourth step is to work out the formation of the profile or contour lines. This may be accomplished through the use of radial lines, concentric circles, parallel lines, curved lines, ellipses, the spiral, or any other appropriate scheme. This scheme may be shifted and changed until the most pleasing and useful effect is obtained.

Step five is to determine the most appropriate surface decoration or enrichment. This decoration or enrichment may be in the form of paint, stain, overlay, inlay, contrasting colored woods, pierced work, etc. It should correspond with the general shape of the area divisions and should also follow the approximate directions of the contour lines.

The plan for the candle-stick design was worked around a 4" x 6½" vertical rectangle or over-all area. This over-all area was then divided into two proportional parts to form the base and the stem. These became the secondary areas.

The secondary areas were then divided into three proportional parts each. These divisions were arranged until the best proportions were obtained. It was not necessary to give much attention to the function of the project in determining these proportions.

The contour step-up effect was accomplished by drawing lines from a point located below the base on the vertical center line, through a point slightly below the centers of the ends of the base divisions and through the top corners of the stem divisions. With a little planning many similar pleasing effects may be accomplished in this way.

The project was turned from glued-up stock of contrasting colors which add considerably to the surface enrichment. The layers of contrasting colors emphasize the shape of the base, and the lines formed by the joints between the light and dark woods follow the contour lines thus adding to the appearance of the stem. The project was finished with oil and wax.

Given the basic knowledge, as outlined here, and the opportunity to work out their own designs, most students will soon become more independent in their thinking and planning, and better appearing projects will be the result.

Drafting Teacher's Time Saver

BY *Lawrence Matson*

Here is a short-cut for drafting teachers to use when checking dimensions on drawings. Lawrence Matson teaches in the McKinley Occupational School, Dayton, Ohio.

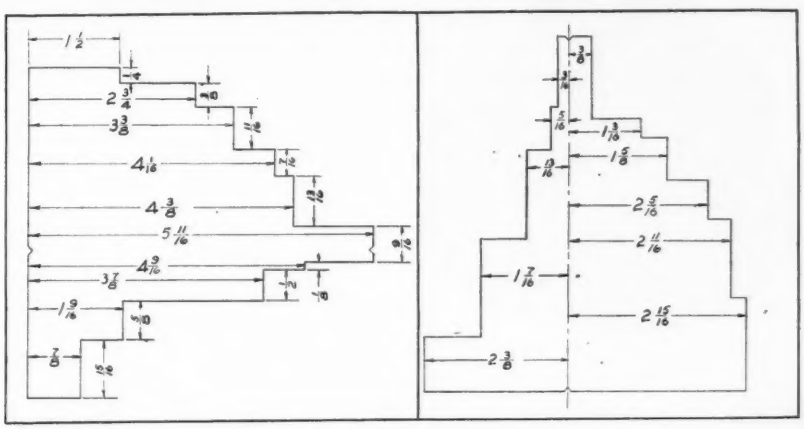
AT the beginning of the drafting course, it is important for the teacher not to overestimate the student's knowledge of fundamentals which may have been previously taught. One of the most important of these fundamentals is measuring with an ordinary scale.

I find that a big percentage of boys reaching high-school level cannot accurately and efficiently read a scale unless they have had seventh and eighth grade drafting in which reading the scale is an important element of instruction. Students have to make use of this ability daily.

In checking drawings, I had to measure every one of the lines separately, which involved a considerable amount of time. Our sheetmetal teacher, Mr. McGuire, suggested a metal template incorporating most of the dimensions used in the drawings.

The instructor can cut any design of template he wishes, using a thin piece of tin. Dimensions can be lettered, scribed, or pasted on the template. By placing the template on the drawing, the pupil's dimensions can be quickly and accurately checked. Any error in the drawing will show up instantly.

In the adjoining column is a cut of the template I have found most useful in checking papers in my classes.



Some Things to Remember

BY *Stanley J. Pawelek*

Supervisor of Industrial Education, Baltimore, Md.

It's more important to know what shopwork does to Johnnie than what Johnnie does to shopwork.

The louder you talk, the more noise the students can make and still hear you.

A demonstration of a tool or machine process is not a *lecture;* students should be kept constantly on the alert with "how" and "why" questions.

Your students are not janitors; their cleaning up should be confined to work stations only—not to sweeping floors or scrubbing windows.

Your supervisors are among your best friends—welcome them in your shop.

You must *learn* your students before you can *teach* them.

A toolroom is a "bottleneck" in any shop if much thought is not given to its organization.

A teacher worthy of the name is usually considered a "regular guy" by all who know him.

"Sell" your ideas to your students instead of "thrusting" them, and you will be a more successful teacher.

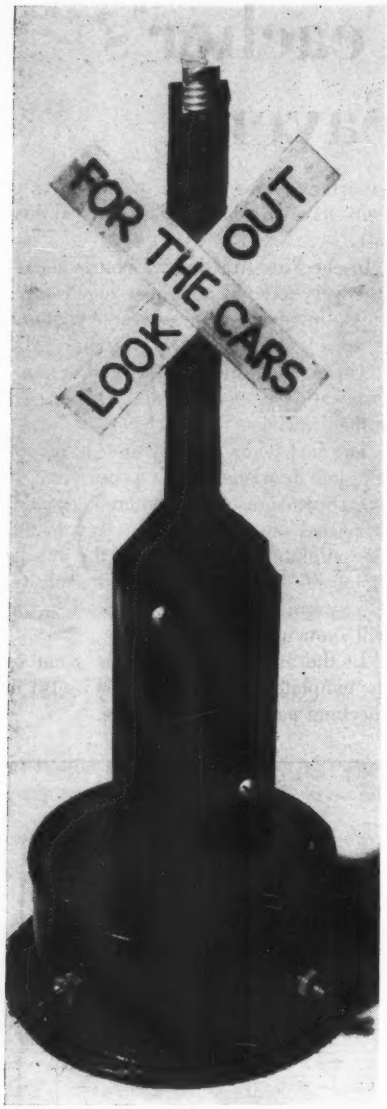
Good teachers very seldom sit at their desks when teaching a class.

A sense of humor is a good teacher's biggest help.

Automatic Crossing Signal

BY *E. A. Rerucha*

Student interest is high in accessories for model railroads. A project of this type is most effective when used specifically to teach about electricity and sheetmetal work. E. A. Rerucha teaches in Leyden Community High School, Franklin Park, Illinois.



TESTED INSTRUCTIONAL PROJECT

THE mechanism from an ordinary small door bell is adapted to the operation of this crossing signal.

The order of construction follows:

1. Remove the ringing unit from the bell. The magnets and hammer are usually assembled on one piece of iron which is clamped or riveted to the base. Cut off the enlarged end of the hammer and bend as shown in Fig. 1. Scrape the enamel from the magnet coil leads and make several turns of the wire through the holes and over the edges in the spool ends. Solder the turns. Cut off the spring contact on the armature above the rivets. This will not be required since the bell will operate as a single stroke bell when the circuit is closed through the track contact.

2. Remove the shell from a miniature lamp socket. This may be done by giving the socket a slight blow with a hammer to break the composition case. Unsolder the two leads from the shell and solder another piece of No. 20 insulated fixture wire about 11" long to the bottom contact of the socket. Trim off about 1/8" of the socket rim.

3. Make the standard. This is cut out of 28-gage sheetiron according to the dimensions shown in Fig. 1. Drill holes 3/16" in diameter for screws for attaching cover and cut a 1/4" x 1/2" rectangular hole in bottom end of standard as shown in Fig. 1. Cut a "U" in top of the standard 3/8" x 3/4" for mounting the socket.

4. Make cover shown in Fig. 3 from No. 28 sheetiron.

5. Make hammer shown in Fig. 4 from a piece of iron wire.

6. Make the brace cover shown in Fig. 5. This is also cut from 28-gage sheetiron.

7. Cut off the bottom from a tin can 3" in diameter for the base. See Fig. 6. Cut and drill the holes in the bottom as shown.

8. Solder the lamp socket shell in the "U" of the standard as shown in Fig. 1. Make certain that the bottom contact is not grounded while soldering.

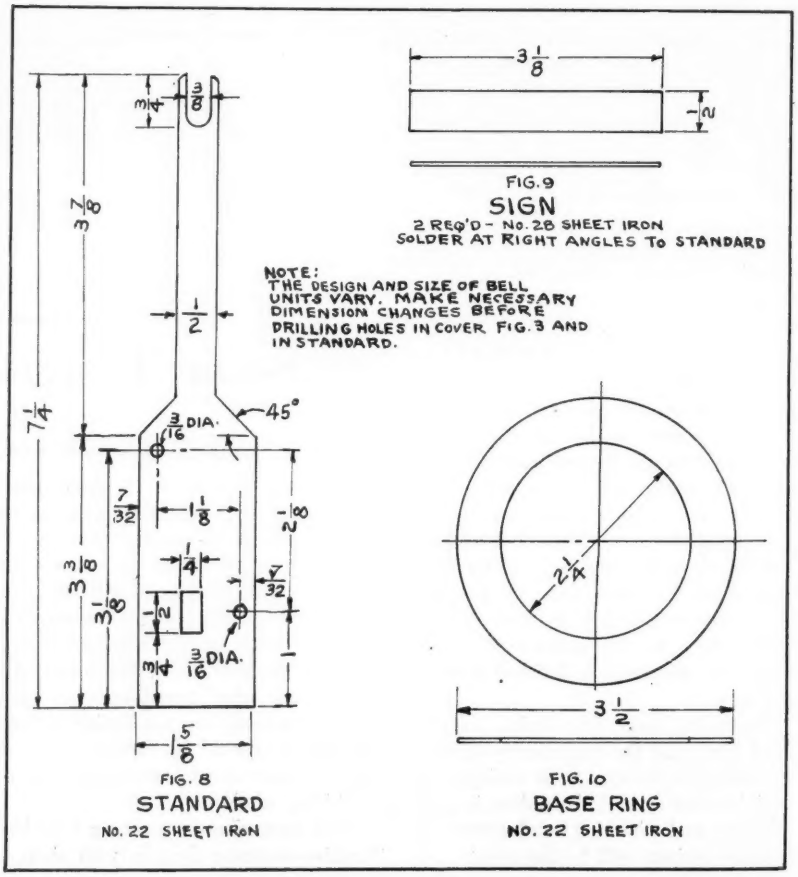
9. Solder magnet unit to standard as shown in Fig. 1.

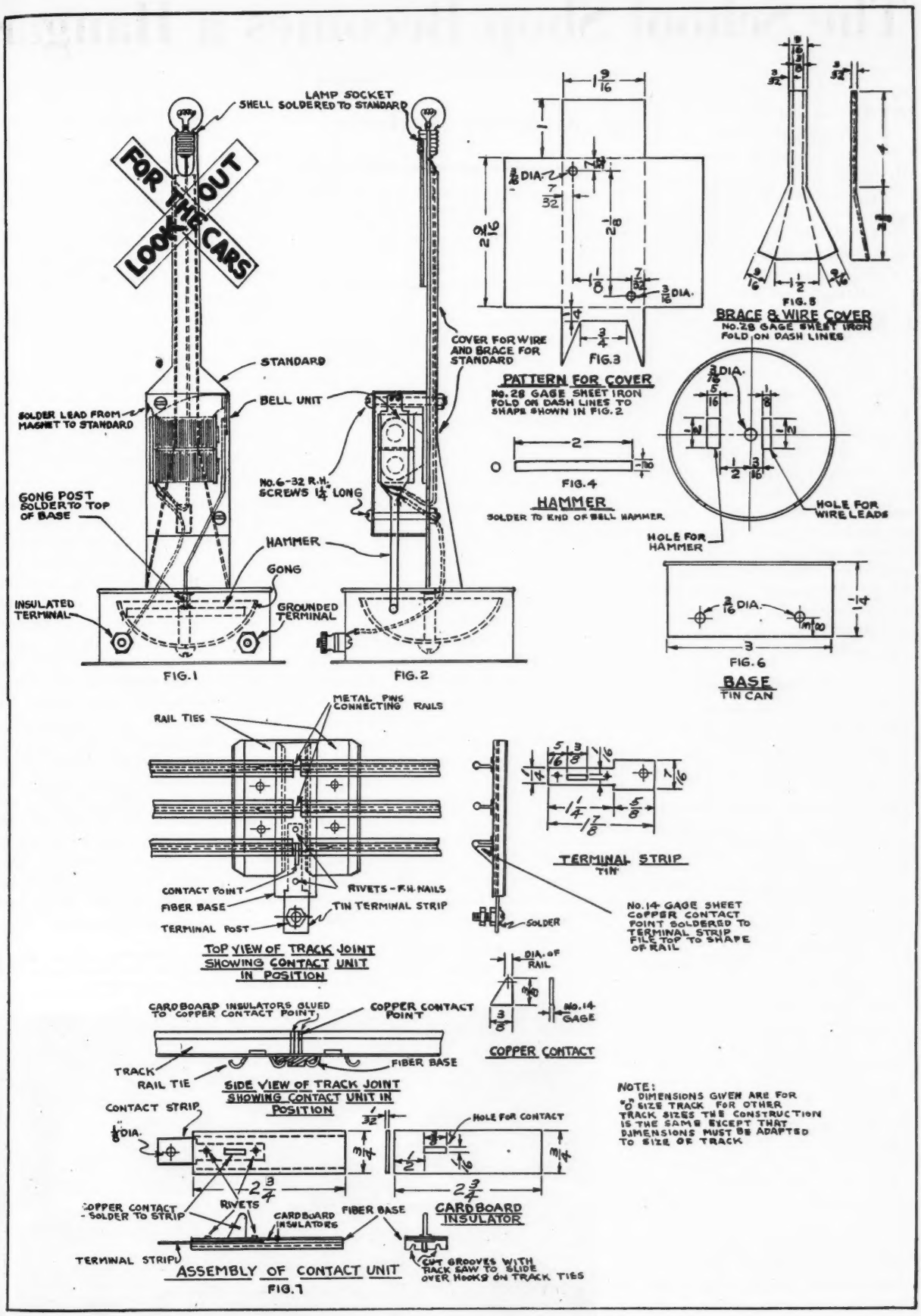
10. Solder gong post, removed from bell, to inside of base in center hole.

11. Solder standard to base between the two rectangular holes so that the hammer is free to move in the 5/16" x 1/2" hole.

12. Remove the terminal posts from bell base and install in side of base as shown in Fig. 1. Bring the lead from lamp socket down through hole in standard. Solder to magnet coil terminal and then continue through the 1/8" x 1/2" hole in base top to insulated terminal post and solder to post. See Figs. 1 and 2.

(Continued on page 20)




LAMP SOCKET
SHELL SOLDERED TO STANDARD
FOR THE OUT
LOOK THE CARS
STANDARD
BELL UNIT
SOLDER LEAD FROM MAGNET TO STANDARD
GONG POST SOLDER TO TOP OF BASE
HAMMER
GONG
INSULATED TERMINAL
GROUNDED TERMINAL
FIG. 1
COVER FOR WIRE AND BRACE FOR STANDARD
No. 6-32 R.H. SCREWS 1¼" LONG
FIG. 2
PATTERN FOR COVER
No. 28 GAGE SHEET IRON
FOLD ON DASH LINES TO SHAPE SHOWN IN FIG. 2
FIG. 3
HAMMER
SOLDER TO END OF BELL HAMMER
FIG. 4
BRACE & WIRE COVER
No. 28 GAGE SHEET IRON
FOLD ON DASH LINES
FIG. 5
HOLE FOR WIRE LEADS
HOLE FOR HAMMER
FIG. 6
BASE
TIN CAN
RAIL TIES
METAL PINS CONNECTING RAILS
CONTACT POINT
FIBER BASE
TERMINAL POST
RIVETS - F.H. NAILS
TIN TERMINAL STRIP
TOP VIEW OF TRACK JOINT SHOWING CONTACT UNIT IN POSITION
TERMINAL STRIP
TIN
SOLDER
No. 14 GAGE SHEET COPPER CONTACT POINT SOLDERED TO TERMINAL STRIP FILE TOP TO SHAPE OF RAIL
DIA. OF RAIL
No. 14 GAGE
COPPER CONTACT
CARDBOARD INSULATORS GLUED TO COPPER CONTACT POINT
COPPER CONTACT POINT
TRACK RAIL TIE
FIBER BASE
SIDE VIEW OF TRACK JOINT SHOWING CONTACT UNIT IN POSITION
CONTACT STRIP
HOLE FOR CONTACT
COPPER CONTACT - SOLDER TO STRIP
RIVETS
CARDBOARD INSULATORS
FIBER BASE
CARDBOARD INSULATOR
TERMINAL STRIP
CUT GROOVES WITH HACK SAW TO SLIDE OVER HOOKS ON TRACK TIES
ASSEMBLY OF CONTACT UNIT
FIG. 7
NOTE:
DIMENSIONS GIVEN ARE FOR "O" SIZE TRACK FOR OTHER TRACK SIZES THE CONSTRUCTION IS THE SAME EXCEPT THAT DIMENSIONS MUST BE ADAPTED TO SIZE OF TRACK

The School Shop Becomes a Hangar

Part II—Continued from February

BY *Frank B. Bushey*

This is the concluding portion of the two-article series by the author who is an industrial-arts teacher in the Northeast Junior High School, Hartford, Conn. Many specific helps are given for the teacher planning a model-building program.

THE second model for beginning groups is the simplest of all powered models, the indoor stick type. Having learned the fundamentals of model flying through the hand-launched glider, the next step is to apply power to that model. The indoor model makes this transition. Small indoor models of 18" to 24" wingspan are obtainable in kit form through most hobby shops at low price. New areas covered in building and flying the indoor model are building a wing frame, covering with tissue, carving an indoor propeller, forming wire wing clips, forming landing gear (if an R.O.G. model), using and counteracting torque, and adjusting for climb and circle. Here again the same model will be equally interesting to elementary youngsters and to senior high-school modelers. Flights of 10 or 12 seconds are good for younger builders while the absolute ceiling of 29 minutes will remain out of reach for some time to come for the older group. Senior high-school builders will begin to experiment with microfilm for covering, built-up propellers, and their own wing layouts.

The Towline Glider

The towline glider can be introduced early in the spring when good outdoor flying weather has begun. The towliner makes a good transition project from the simpler construction of hand-launched glider and indoor models. The best towliner to begin with will be one that is easy to build, low in cost, and has good flight characteristics. Pod-and-boom types or simple square-sided models are the best bet. The wing is the most difficult part to construct and should be given the most care in building. Covering technics will come in here. Use of dope as an adhesive, laying on covering tissues without wrinkles, stretching the covering by water doping, doping without warps, and avoiding dope blushing are some of the things learned by the beginners. In flying the towliner, A.M.A. weight rules should be followed. It will do the youngsters no good and much harm if they are allowed to learn towlining with underweight "floaters." Balancing the model with clay is an easy technic because of experience with hand-launched gliders. The first thrills of long, graceful flights will come with this model as the youngsters from the sixth grade up have their try at it. One caution that may seem needless is that of identifying the model against its being lost on an out-of-sight flight. It will be a big thrill for the group when the first model disappears from sight but there will be a note of tragedy if there is no way for the finder to return it. Name, school address, and telephone number should be plainly marked on all separate parts of the model. It is important that each part be identified because frequently when a model lodges in a tall tree the rubber bands for holding on the wing and tail will work loose and only part of the model will come down.

A new flying technic to learn with the towliner is towing the model aloft. First attempts should be made with only 25 or 30 feet of towline to avoid breakage because of nose dives. A towline model must be towed according to the conditions of the day. On mild days the hook directly under the leading edge of the wing is usually used. When there is dead calm and the model goes up too slowly, the hook to the rear of the leading edge is used as this gives a greater angle of attack. On windy days, a hook forward of the leading edge should be used or else the model will climb into a nearly vertical position and the force of the wind will cause the wings to fold.

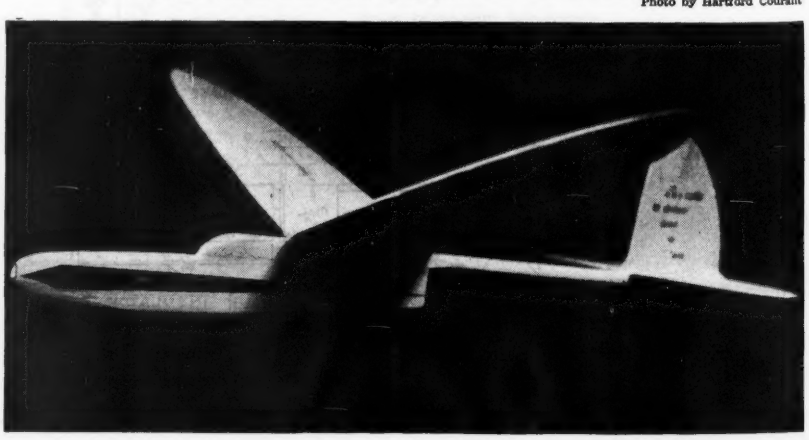
The secret of holding the altitude gained is the proper releasing of the towliner from the towing line. With the ship adjusted to a normal right-turn glide, the line should be released only when the model has leveled off and is ready to begin the turn. The release is gained by slacking off on the line. With the model in a stalling or climbing position on the release, the model will immediately dive and stall, losing all or most of its altitude. With the model level and against the turn, the inside wing will stall, causing the model to spiral in. Perfect launching technic is learned only by practice and study of launching procedure.

Outdoor Power Models

To round out the school model-flying program, the outdoor rubber-powered stick model and the outdoor fuselage or cabin model should be included in the program. There are simple models of these types that youngsters in the fourth or fifth grade can build and fly with some success and there are still national records to be broken by the senior groups. The hand-launched glider has given flying knowledge and the indoor model has introduced power flight. The towline model has given experience in building larger models and in adjusting them for flight. The new things to learn with the stick and fuselage models are the carving of a folding propeller, use of multi-strand rubber motors, the care of rubber, and the adjustment and development of the rubber-powered climb. After the stop in the nose block has stopped the prop and the blades have

(Continued on page 14)

Typical high efficiency hand-launched glider with pod-and-boom construction and high dihedral angle of wings for lateral stability. This is the design of Donald Wild, Hall School senior, West Hartford, Conn. Flat end of pod gives firm hold for launching.
Photo by Hartford Courant



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folded neatly against the sides of the fuselage, the model is nothing more than a glider and gliding technics prevail.

Carving the outdoor rubber prop and adding the folding mechanism are by far the most difficult parts to learn in outdoor rubber-powered flight. There are definite principles of aerodynamics governing the construction of a propeller. Pitch, blade area, and prop speed are all to be considered. With the sixth, seventh, and eighth grades, these matters resolve themselves into following basic rules of construction and layout of the prop. It remains for the senior high-school model aero engineering groups to explore the "whys" and "hows."

Gas-model flying should be confined pretty largely to the senior high-school groups after a sound modeling program has been followed in the glider and rubber categories. Basically, the free-flight gas model is the same as the towline glider except for the use of the model gas engine to get it aloft. After the engine has cut, the gas model's job is to glide. The rules for developing the glide are the same for all of these models. In place of adding balancing clay to the nose, with a gas model the battery box is moved forward or back.

Model Design

Model airplane design follows naturally a successful program in model construction as outlined in the preceding pages. The design factors included in model aviation are as fundamental as those in the design of full-sized craft. This part of the program should be reserved for the junior and senior high-school groups. There is no limit to which such a design program can go. The construction and use of a wind tunnel is just one project. Torque-stands for testing model gas engines and experimentation with and development of model airfoils are other legitimate projects of depth, to name but two.

As important as developing a proper sequence of model-aviation projects is a knowledge of the materials used in the program. The larger part of the beginning program will be based on the construction of models from kits. For the scale-model portion of the program, kits will be selected on a basis of price and building difficulty. Semi-scale models of the various training planes, such as the Cub and Taylorcraft types, are the easiest in the built-up scale category. Solid models of the single-seat fighter-plane type are the easiest beginning models in the solid group. Few kits, except the most expensive, include all the materials needed. Colored dopes, extra balsa for sheeting and filling in fairings are needed. Wire for sturdy landing gear is usually left out of commercial scale kits. Other "extras" are frequently added by youngsters seeking more realism in these models. It is best to "play down" the scale program in favor of the much simpler flying models in the elementary grades.

Supply Sources

For the hand-launched glider program I have relied on the *Thermic "18"* put out by Junior Aeronautical Supply Company, 203 East 15th Street, New York City, because of low price, simple construction, complete descriptions and building instructions, and excellent balsa. There are several other low-priced hand-launched gliders available that could as easily be adapted to the beginning glider program. Steve Patti's (Milwaukee, Wis.) *Yardbird R.O.G.* is a fine little 15c indoor model for the beginner. The A.Y.A. models 2 and 3 are also excellent beginners' indoor types though slightly higher in price. Several other model houses manufacture easily-built indoor types.

The new *Thermic C*, a Junior Aeronautical Supply Company model, represents a new high in a simple, easily built towline model with unusually fine flight characteristics. There are several small towline models available. Unfortunately most of them have poor flight

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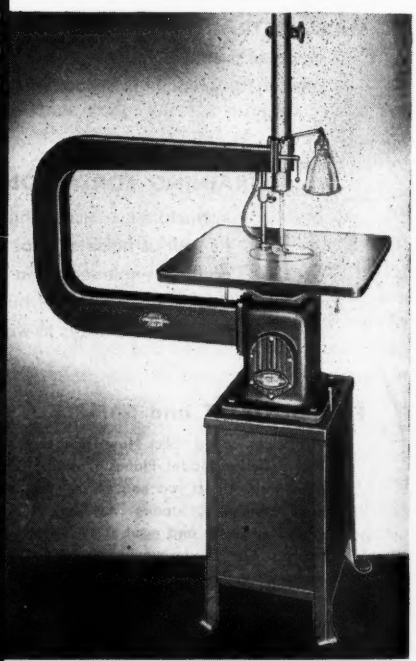

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characteristics and few of them are designed so that they are within the building ability of beginners.

There are many stick and fuselage models with fine characteristics available from practically all model houses. The Supreme Flying Model (Steve Patti) *Thermal Bagger* and the Cleveland *Polish Defiance* are excellent first stick models. The Best-by-Test (Ridgefield, New Jersey) *Stratometer* is a good junior and senior high school beginning stick model as is the *Gollywock* of Midwest (Chicago). The Supreme Flyer *Electron*, the Scientific *Gold Star* and *Victory* are low-priced beginners' fuselage models. The Midwest *Jabberwock* and the Best-by-Test *Altimeter* are two good advanced fuselage models. Your hobby dealer can supply all of these. The polyhedral wings of the Midwest and Best-by-Test models plus their modern designing put them at the top of the outdoor contest groups for building.

Dopes and cements cost the youngster 10c per ounce at his usual sources. Buying by the gallon reduces this cost to about 2 cents an ounce! Other materials can be purchased in large quantities at similar reductions. Balsa is particularly adaptable to group purchase in that balsa planks can be stripped in the school shop and will reduce the cost to the youngster considerably.

The *Model Airplane News*, 551 Fifth Avenue, New York 17, New York, and the *Air Trails Pictorial*, 79 Seventh Avenue, New York City, are the two prime sources of model-aviation information. Each of these magazines publishes plans of the latest designs and news of model-aviation interest in addition to articles on model-aviation theory.

Charles H. Grant's *Model Airplane Design* and William Winters' *Model Aircraft Handbook* are the nearest approach to textbooks now avilable. Grant's book is a scholarly approach to model design and theory while Winter's book is a more easily understood treatment of the areas of modeling and is suitable for use in grades six to nine.

In Conclusion

Model aviation is receiving increasing attention both within and without the school program. Teachers can capitalize on student interest in the area to integrate the shopwork with other subjects in the curriculum. Nevertheless, the shop teacher is the logical person to have major responsibility for the program and to take the leadership in formulating it. By beginning with the younger age groups and "growing up" in modeling with them, he can develop an outstanding program. Early stumbling and ineptness will be overshadowed by the enthusiasm and interest of the youngsters. The thrill of that first 20-second hand-launched glider flight will be equal to if not greater than that received when a high time of 50 seconds is made in the final meet of the year.

GAIC

A NEW organization—GAIC—sprang into being at the Buffalo meeting of the American Vocational Association. It all got started when, at some of the industrial-education and the industrial-arts section meetings, the panel discussants thought the groups should go back to the fundamentals and define objectives, a most laudable but inflammable topic.

After bandying around such phrases as "prevocational," "element of general education," "trade competency," "manipulative skills," "life situations," and a score of others, a group of the more statesmanlike thinkers in the field retired we shall say not where and established GAIC—"Gosh! Am I Confused."

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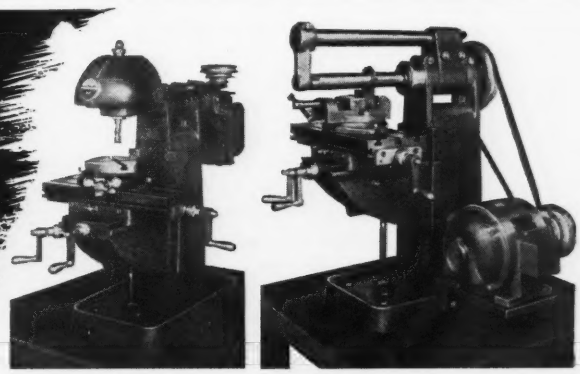

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Dynamic Color for School Shops

BY *Hayes Quinn*

The scientific use of color in the school shop can create a more efficient instructional environment and can transform the shop into one of the most attractive of all rooms. Hayes Quinn is Color Consultant of the Department of Color and Design of the Pittsburgh Plate Glass Co., Pittsburgh, Pa.

UP New England way in Danvers, Massachusetts, is a small production establishment known as the Yankee Shop. Normally engaged in building "live steam" models of railroad trains, it was converted to turning out precision machined parts for war equipment. It is a unit not unlike a great number of school shops throughout the nation as regards physical layout, although it is devoted to making extremely fine mechanisms. Like many other shops, both industrial and school, before the war it was painted in the traditional achromatic style of depressing grays, whites, and blacks. As an industrial unit, the Yankee Shop was considerably better than average. It was orderly, neat, and well kept, but nevertheless unattractive to the eye on account of the lack of color.

Always on the alert to improve the shop, the management, hearing of the newly discovered scientific use of the power and energy in color for creating efficiency and beauty in a shop, had their establishment color-styled according to Color Dynamics principles. Bodies of drab gray machines became attractive with cool vista green. Operating parts were done in a contrasting ivory focal color. Highly visible focal orange marked the wheels and levers and focal red highlighted the switches. Both colors lent the right amount of sparkle to the over-all job. Neutral wall tones were replaced with eye-rest green and the ceiling was made a lighter shade of the same color. A cheerful atmosphere was created with suntone on doors and window frames and emphasized with a dado of the same shade. Completing the transformation was treating of cabinets and workbenches in focal blue and anvil red.

Today this shop is not only a most pleasant place in which to work, but it is a show place of the area attracting visitors —especially hobbyists—from all over the country.

Proves Two Points

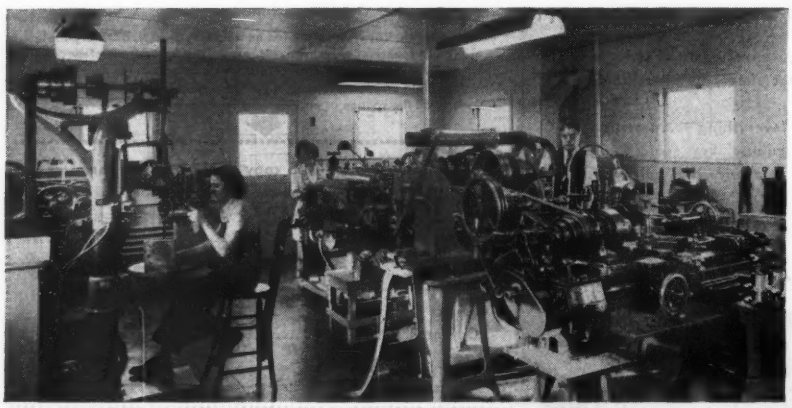
From this very practical example of the value of Color Dynamics industrial education teachers can draw two very pertinent conclusions: first, that the engineered use of color can serve as a definite auxiliary instructional aid in developing manual and mechanical skills and in contributing to orderly shop procedure and safety practices; second, that color can change the school shop from one of the least aesthetically attractive areas of the school into rooms which are functionally correct and in perfect design. The latter consideration, while less important fundamentally than the first, is of particular significance in that it provides an economical method to design a shop so that it will compel the admiration of both students and visitors. All too often the drab aspect of gray machinery, white walls and ceilings, gray workbenches, and gray material has caused a depressing effect, not only on students but also on visitors ranging from parents to school-board members.

Just as the color styling of a large rubber company prompted a vice-president to say, "Every time I visit the plant I am more impressed with the color painting" so will the scientific use of colors in the school shop elicit respect and support.

Admittedly the proper color styling of a vocational shop or industrial-arts room is a task infinitely more complex than decorating an average classroom. However, by adhering to well-defined basic principles of color selection and placement, the instructor can achieve a decorative scheme that will meet the needs. Treatment of machinery and equipment should follow the war-tested pattern which industry found so effective. This is based on painting all nonoperating parts in vista green. This has a soothing effect on the human eye and causes the noncritical parts to recede visually. Operating parts should be finished in a color such as focal ivory to make them move forward and serve as a contrast to the material being worked upon. This pattern naturally induces the student to keep his attention on the work being done. Wheels, levers, and other controls should be spotlighted in focal orange so that they are immediately visible to the student wishing to start, stop, or adjust the machine. Electrical switches and controls call for finishing in focal red, the universal color for such applications. This type of color styling is equally effective for metalworking, woodworking, or any other type of machinery or equipment. The colors used not only serve to minimize eyestrain and fatigue, but are those commonly accepted for safe working practices in industry.

The floor of the school shop can also be treated in accord with a more or less general pattern adopted in many of the nation's largest industrial plants. A dark cruiser gray would be suitable for the larger area of the floor. All aisles, storage spaces, and other areas which might be dangerous or used for special purposes should be set off with bands of focal orange. The aisles themselves should be in a different color from the general floor color and could be in dixie gray. School shops, as a rule, do not have much mobile equipment; where there is such equipment it should be painted in focal yellow with diagonal stripes of black, so as to be plainly visible. Movable or stationary bins or material containers should have the interior surfaces in a color contrasting to that of the material stored so that visual

Extensive use of eye-rest green and harmonizing colors makes for efficiency and happiness in this shop of the Yankee Machinist, Danvers, Mass. This same atmosphere can be created in the average school shop by intelligent use of the principles of Color Dynamics. Although black-and-white photos do not show the inherent beauty of such treatment, the over-all effect of color can be seen in this interior view.



estimates can be made of the amount on hand.

Walls, Ceilings Planned Individually

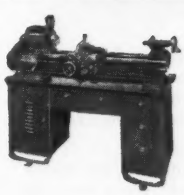
Although it is possible to more or less standardize the treatment of machinery, equipment, and floors of the industrial-arts shop, the color styling of the walls and ceilings must be done largely on an individual basis. This is because of such variable factors as physical layout, geographical location, amount of natural and artificial illumination, and proportions of the shop. The most important wall areas in color styling a school shop are those which the student machine operators face. The student is bound to glance up from his machine from time to time. If the wall is decidedly lighter or darker than the machine, a quick adjustment of the eye is involved each time the motion is made. These walls should be painted in an eye-rest color not too far removed in value from the major color of the machine. Other walls not in the student's direct line of vision can be painted cheerful and sunny colors such as suntone. Ceilings generally call for a light color with sufficiently high reflective value. In cases where the shop ceiling is cluttered with beams, wiring, pipes, and other apparatus, cascade blue is the best choice. This gives the appearance of lightness and airiness and compensates for the bulkiness of the overhead mass.

Selection of the exact shades and tints for finishing the walls and ceilings of the school shop will depend on the physical factors previously mentioned and the particular power or attributes of each color. The various colors can be classified in several different groups according to their physical characteristics. They may be warm or cool colors such as those in the yellow, orange, and red range. These suggest heat, sunshine, life and are therefore useful in the school shop where stimulating effects are required to counteract effects of lack of natural illumination or overabundance of northern light. Colors containing blue suggest winter, ice, snow, and water and are thus cool in nature. Except in rare cases in the school shop where blue might be needed to compensate for too much sunlight from the south or west, it should not be used. In the form of blue-green, however, this color acquires some practical value for wall treatment.

Some Color Characteristics

Those colors to the right of center of the solar spectrum are known as "advancing" colors and those to the left as "retreating" colors. These characteristics can be used to change the apparent physical proportions of a school shop. Long narrow shops can be made to seem wider by use of darker shades on the end wall and lighter colors on the long side walls. The monotonous feeling of a square shop can be eliminated by finishing the wall opposite the windows in a color value different from the other three walls. Painting the ceiling a darker color than the walls will tend to reduce the apparent height of a shop and a light color will create the opposite effect.

Proper integration of color and lighting in shops is of cardinal importance as all colors are affected by light. Generally incandescent light does not seriously change a color value. It tends to reduce strength and intensity with a slight yellowing effect. The reaction on color of fluorescent types is more pronounced. Daylight units of this type give off a fairly blue hue making it best for use with blue, blue-green, and green. If other colors are used the result would be the same as if a small amount of blue pigment were added to them. The white and soft-white fluorescent units produce warm light of reddish hue; thus they are best used with such colors as ivory, cream, beige, or tan. These units should not be used with green or blue colors as the latter would tend to become a dark gray. *(Continued on page 20)*



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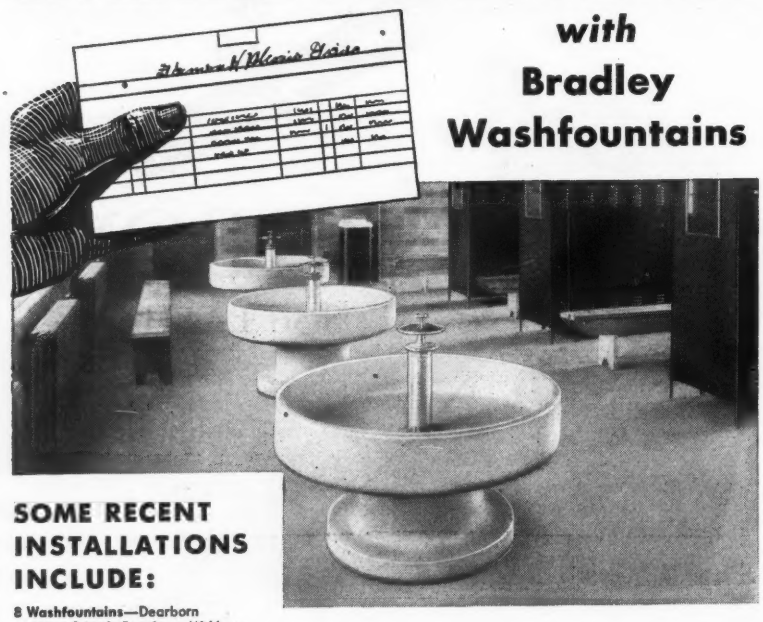
Color Can Help

Although the scientific use of color in a school shop is not suggested as a panacea for the many problems besetting the instructor, it will go far in helping promote the aims and objectives of the industrial education program. Color Dynamics when properly employed in the school shop will:

1. Provide adequate illumination through proper distribution thereby achieving visual efficiency and eye comfort.
2. Safeguard the health of students and instructors through reduction of nervous tension.
3. Increase morale by creating a cheerful environment.
4. Build respect and prestige for the industrial shop itself among school officials and the community.

The impression of a shop which people either consciously or unconsciously form is directly influenced by its physical appearance. If the machines and equipment are cheerful, attractive, and efficient-looking and set in a pleasant environment, the shop will tend to inspire a feeling of trust and confidence. The correct use of color will give the students and all those associated with the shop a feeling of pride, will build a spirit of cooperation and loyalty and thus induce universal support of the school shop.

Modern Schools Everywhere Have Gone ON RECORD FOR CLEANLINESS with Bradley Washfountains



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Write today for interesting picture Catalog 4308 and Washroom Survey Sheet.

BRADLEY washfountains

Signal . . . . *from page 11*

Solder the other wire from magnet to standard as shown in Fig. 1.

13. Cut off a piece of heavy iron wire shown in Fig. 4 and solder to end of hammer as shown in Figs. 1 and 2. The end of the wire should touch the gong when the armature is away from the magnets and strike the gong opposite this point when the armature is attracted by the magnets as the circuit is closed. Some adjusting may be necessary by bending the hammer until the proper position is obtained. The gong is attached to the post with the original screw.

14. Attach cover with two No. 6-32 round-head bolts 1¼" long. See Fig. 2.

15. Solder the brace and cover shown in Fig. 5 in place as shown in Figs. 1 and 2. Solder along the bottom also to reenforce the standard.

16. Cut two pieces of 28-gage sheet-iron 9/16" x 3" for the cross-bars and solder to standard as shown in Fig. 1.

17. Paint the base concrete gray and the standard any desired color. The cross-bars should be painted white with black lettering. The lamp should be tinted red.

The Track Contact.—The track contact is shown in Fig. 7. It is placed between the junction of one of the grounded or outside rails. The metal pin is removed from the rails at this junction. The contact is mounted on a piece of hardwood, fibre, or composition shaped as shown in the drawing. The contact must not touch any part of the track. As the wheels of the train pass over the contact, the circuit is closed to the two grounded rails thereby closing the circuit to the signal. The hammer strikes the gong, operating as a single stroke bell, and again on the rebound when the circuit is broken as the wheel has passed beyond the contact. This action will take place every time a wheel passes over the contact. One lead from the signal is connected to the contact terminal and the other to the third rail.

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NEWS

What's Doing in the Field of INDUSTRIAL EDUCATION

AIAA to Meet

PLANS are being formulated for a resumption of the annual Spring Conference of the American Industrial Arts Association to be held during May in either New York or Chicago. The meeting will be in the form of an executive conference with delegates expected from the 35 affiliated associations and a large representation of active members. Reports from committees and from the Curriculum Commission will be presented and the future of the *Industrial Arts Teacher* will be discussed. The exact date and place of meeting will be announced later.

Wichita Moves

THE Board of Education of Wichita, Kansas, has approved the building of a vocational-technical high school at a cost exceeding $1,500,000. The site and architect have been selected. Advisory committees composed of business, industrial, labor, and educational groups are now engaged in working on the curriculum. The date for voting on the bond issue has not been set. In addition to making plans for the vocational-technical high school, the committees are at work on an improvement plan for industrial arts in the present school program. Renewed emphasis is to be placed on prevocational training for all students.

Indiana Convention

THE Indiana Industrial Education Association will meet on April 19-20 at Indianapolis.

Request

STUDENTS in industrial-education classes in Washington, D. C., schools have been asked to build sea-going library chests for merchant ships by the American Merchant Marine Library Association. The chests are designed to fold up. When open they have shelves for 40 standard-sized books, 20 pocket books, and 10 magazines. Washington students have a long record of constructing projects for the Red Cross. During the war they turned out 1008 walking canes, 505 lap boards, 800 writing boards, 155 miniature game kits, 220 cribbage boards, 430 watch holders, 95 heavy-type folding chairs, 50 checkerboards, 30 Gibson Island-type chairs, 50 sets of splints, 4 stretchers, 843 ash receivers, 50 floor lamps, and hundreds of other articles.

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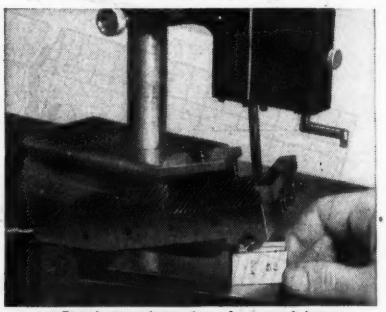

Setting a sine-plate for precision inspection of an angle or taper.

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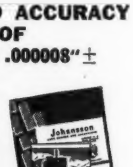

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Report from Buffalo

The AVA Convenes

APPROXIMATELY 1500 members of the American Vocational Association registered for the 39th annual convention held February 6-9 in Buffalo, New York. Interest centered on the announcement by J. C. Wright early in the week that R. W. Gregory has been appointed his successor as director of the Division of Vocational Education and will assume office as acting director almost immediately. Dr. Wright has been appointed to make a survey of vocational education in the Panama Canal Zone and will have left this country by the time this issue of SCHOOL SHOP reaches its readers. Mr. Gregory has been a member of the staff of the Vocational Division of the U. S. Office of Education for some time and formerly taught agricultural education at Purdue University.

Major interest at the various section meetings centered about the education of veterans and area vocational schools. Leadership problems were also discussed in several section meetings.

The industrial-arts education section meetings drew record crowds. Under the able leadership of Frank C. Moore, vice-president for industrial arts, and Roy G. Fales, program chairman, the meetings were of such interest that in at least one instance the accommodations were insufficient to handle all those wishing to attend. Announcement was made at the industrial-arts section meeting of the publication in the near future of two new bulletins by the section. One will be on teaching improvement in industrial arts and the other will be on state supervision. Other bulletins are also planned.

The House of Delegates meeting was held Friday night, February 8, just preceding the awarding of the prizes by the Ship, the organization of firms exhibiting at the convention. The principal matter before the House of Delegates was the election of officers for the coming year. It has been customary for the nominating committee to bring in a slate which is passed by the House of Delegates without further nominations. Preceding the report of the committee, President M. D. Mobley read a letter from George Fern, vice-president for industrial education, asking that his name be withdrawn from consideration by the nominating committee for the office of president. The nominating committee then brought in its slate consisting of C. L. Greiber, Wisconsin State Director of Vocational Education, for president; Charles W. Sylvester, Director of Vocational Education, Baltimore, Md., for treasurer; H. C. Fetterolf, Pennsylvania State Department of Public Instruction, as vice-president for agricultural education; and Grace M. Henderson, Department of Home Economics, University of Arkansas, as vice-president for part-time education. The president called for nominations from the floor whereupon a member of the Michigan delegation, Tom Diamond, went to the rostrum and asked that the House of Delegates disregard Mr. Fern's letter and he placed Mr. Fern's name in nomination. Mr. Diamond remarked on the need for bringing into the open some of the discussion about the organization which had been going on during the convention. Mr. Fern then asked for permission to speak and stated that, in the interests of unity and the welfare of the organization, his name be withdrawn. This action was followed and the slate as listed above was elected. Mr. Greiber made a brief statement indicating his interest in the future development of the AVA.

L. H. Dennis, executive secretary, announced that the next convention would be held in December, as in previous years, with Atlantic City, Miami, and St. Louis being considered in the order named. Final decision will depend on facilities and dates available.

Sheldon

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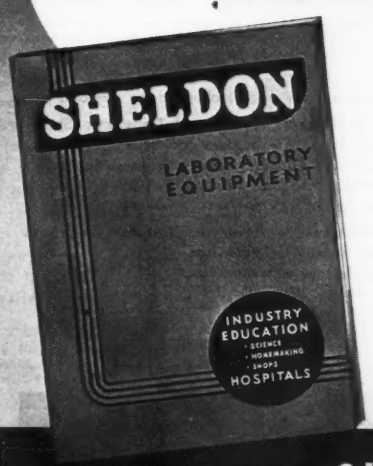

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School Shop KINKS

A dollar will be paid for each "Kink" published. Send to the Editor, School Shop, Ann Arbor, Mich.

Sharpening Knives

Many times blades used in X-acto knives are thrown away because it is difficult to get them razor-sharp. However, I find that by lightly buffing the edges on a buffing wheel the knives become even sharper than when first purchased. This method is also useful for securing a razor-sharp edge on a knife or plane blade after sharpening on a stone. Hold the blade with the sharp edge down—just the opposite to that when using a grind stone. One blade has been used in my shop for six months with a daily resharpening on the buffing wheel.—*George McGinnis, Goshen, N. Y.*

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Lubrication Record Chart

Many of the failures of machines can be traced to improper frequency of lubrication, that is, the machine is oiled or greased either too often or not often enough. When one has a number of machines to take care of, it is easy to forget when each one needs attention. This record chart tells at a glance how often each machine should be lubricated and when it was done last. This is much more convenient than tagging each machine separately with a record card.

Lubrication Record

Machine	Freq.	Date Lubricated					
PRINTING PRESS	M	AUG.3, 1945	SEPT.1, 1945	OCT.5, 1945	NOV.2 1945	DEC.4, 1945	JAN.3, 1946
PAPER CUTTER	Q	APRIL3 1945	JULY 2, 1945	OCT.4, 1945	JAN.3, 1946		
STAPLER	S	JULY 2, 1945	JAN.3, 1946				
MOTORS (GREASED)	A	JAN.2, 1945	JAN.3, 1946				

M- Monthly Q- Quarterly S- Semi-annually A- Annually

The illustration shows a sample card in use.—*Thomas Jungck, Nathan Hale High School, West Allis, Wis.*

A Clip for Snips

An ordinary nail clipper (finger) is quite useful for the printing student and teacher. Needing but lacking a center "bullet" to modernize a job, a snip of the clip and an ordinary semicolon is transformed to do the job. On a rush job with little time to open a form and fix an overlapping rule or an uneven one, a snip of the clips and the job is done. Much printing equipment is expendable so the loss of a piece of type or rule is not an important consideration.—*A. Lewis Herzberg, L. G. Hine Junior High School, Washington, D. C.*

Teachers ! ! !

HAVE you sent us your February Shop Teachers' Service coupon yet? If not, please review the service immediately on pages 13-17 of the February issue, check the items you need, and mail it *now* to SCHOOL SHOP, 330 S. State St., Ann Arbor, Michigan. In order to insure your receipt of these many excellent teaching aids—it is necessary for us to receive *your coupon* as soon as possible. Please—your immediate attention!

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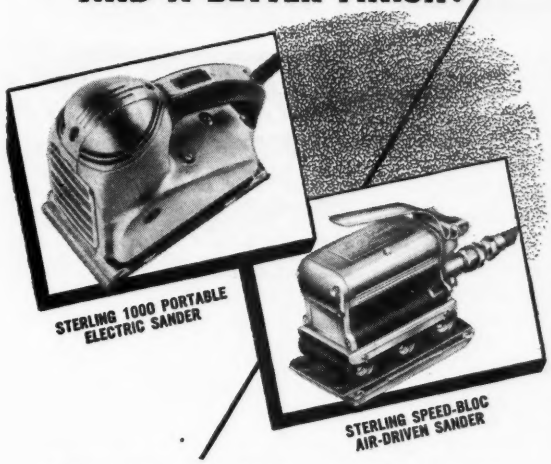

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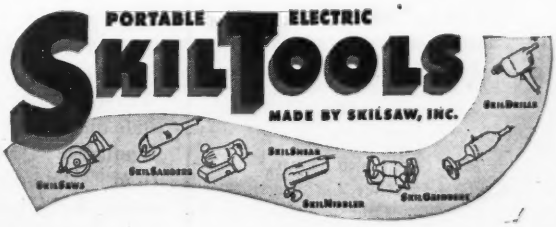
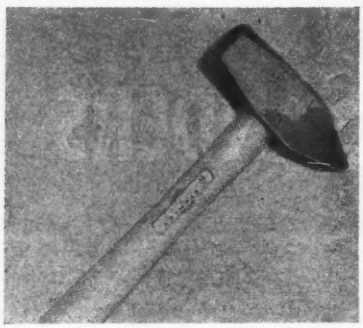


"Thanks, thanks to thee, my worthy friend,
For the lesson thou hast taught!"



TO the teachers of industrial and vocational arts, we rededicate this tribute of Longfellow's. For who better teaches so that of each pupil it might be said "A mighty man is he!" Not that one in a thousand pupils is apt to become the "village smithy," but those who do learn through you to earn with hands and dignity must feel naught but thanks.

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ABOUT YOUR FELLOW TEACHERS

MERRITT W. HAYNES, with the U. S. Office of Education in teacher-training and foreman-training work for the past 3½ years has recently joined the faculty of the University of Georgia as professor of vocational education. . . . ALLEN D. BACKUS, director of practical arts in the Newark, N. J., schools, died December 19 at 54 years of age. . . . New officers of the Kansas Vocational Association are: president, HARRY MCKIMMEY, Wichita; vice-president, R. L. WELTON, Tonganoxie; secretary-treasurer, F. E. CARPENTER, Topeka. . . . T. E. HAMPTON, former director of Huey P. Long Trade School, Winnfield, La., has been named assistant state supervisor of trade and industrial education for Louisiana. . . . CHARLES B. MANNING has been appointed assistant state supervisor of trade and industrial education in Louisiana in charge of veterans' training. . . . New officers of The Ship, social organization of the representatives of reliable firms doing business in the educational field are: captain, AL OPIE, the O-P Craft Co., Inc.; first mate, BERT CHOLET, Higgins Ink Co., Inc.; second mate, JOHN BACKUS, American Type Founders; log officer, CHARLIE STONER, C. Howard Hunt Pen Co.; purser, C. L. MESSMORE, International Textbook Co.; radio officer, ERNIE TRESSELT, Devoe & Raynolds Co., Inc.; and steward, CHUCK LYMAN, Rockford, Ill. . . . L. E. WASS, director of adult education in the Davenport, Iowa, schools, has been elected president of the Iowa Vocational Association. . . . URWIN ROWNTREE, chief of industrial education, Pennsylvania State Department of Public Instruction, has been appointed associate professor of industrial education at The Pennsylvania State College. . . . W. E. LOWRY is the new state director of vocational education for Texas. . . . New officers of the Kansas Industrial Arts Association are: president, P. W. CHAMNESS, Topeka; vice-president, N. M. CONNETT, Kansas City; and secretary-treasurer, R. L. GRANDLE, Wichita. . . . WATSON ARMSTRONG has been named state director of vocational education for Kentucky. . . . FRED A. SMITH has retired as state director of vocational education for Arkansas to devote full time to his farming interests.

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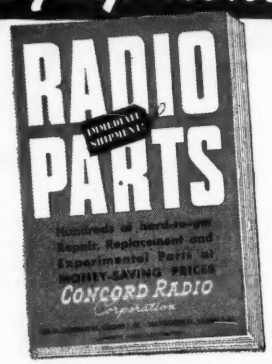

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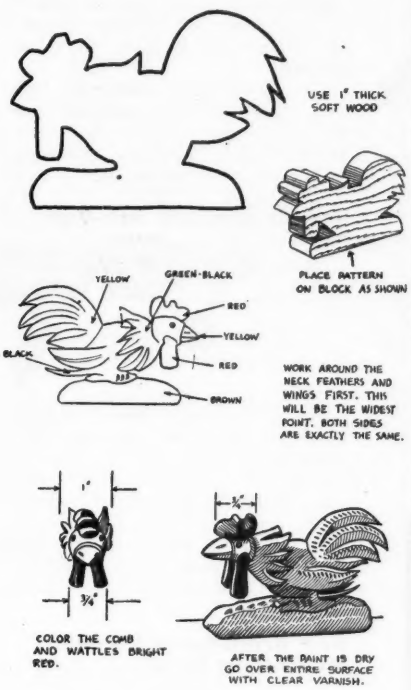
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PLACE PATTERN ON BLOCK AS SHOWN
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BLACK
RED
BROWN
WORK AROUND THE NECK FEATHERS AND WINGS FIRST. THIS WILL BE THE WIDEST POINT. BOTH SIDES ARE EXACTLY THE SAME.
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You'll Have Plenty To CROW About!

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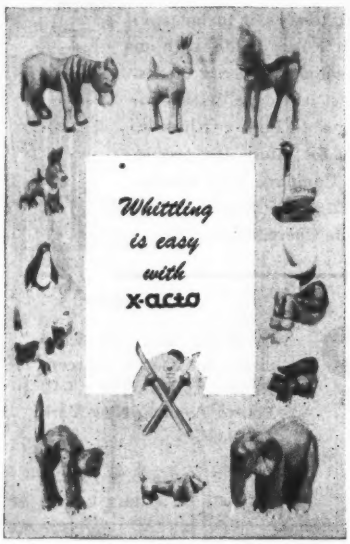
News from INDUSTRY

Excellent Booklet Offered by X-acto



X-acto Crescent Products Co. has recently released an excellent booklet for the handicraft teacher. Twenty-five projects, completely illustrated in a step-by-step manner, lift whittling to an art.

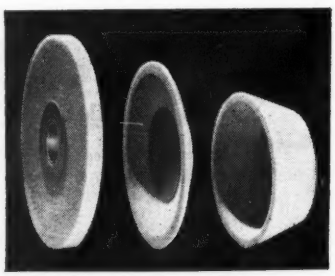
Ten cents per copy. Write X-acto Crescent Products Co., Inc., 440 Fourth Ave., New York 16, N.Y.; *or check no. 49 on the coupon, enclosing 10c.*

Deci.Point Slide Rule Now Being Made of Dowmetal

The Deci.Point slide rule (see March, 1945, SCHOOL SHOP) is now being made from lightweight Dowmetal which makes possible a number of advantages. Dowmetal permits superior accuracy as it is not affected by climatic conditions of heat, cold, or moisture. There is no perceptible warping, swelling, or other distortion. Dowmetal, moreover, can be machined to extremely close tolerances. This permits the use of a selfcentering "optical groove"—a type of tongue-and-groove construction favored in optical instruments because it prevents side play and binding.

For full details on the new slide rule, write Pickett & Eckel, 53 W. Jackson Blvd., Chicago 4, Ill.; *or check no. 50 on the coupon.*

Macklin Develops New Wheels

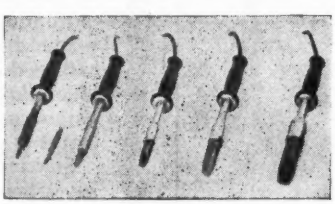


A new booklet announcing V 6 and V 5 Bond, latest development in bonding materials, has recently been issued by the Macklin Co.

V 6 Bond for grinding tools and for surface grinding steel and the V 5 Bond for grinding carbide-tool tips are the result of a great deal of laboratory work and experimentation. Thousands of trial records were collected and studied.

The 32-page booklet gives recommendations for working operations with reamers, milling cutters, hobs, broaches, etc. For a free copy write Macklin Company, Jackson, Mich., *or check no. 51 on the coupon.*

New Line of Soldering Irons



A new and improved line of industrial soldering irons has been announced by General Electric. Ranging from 75 to 300 watts in size and available with tips from ⅜" to 1¼" in diameter, the new irons are designed for severe and exacting industrial soldering operations. However, they are also very suitable for light, medium, and heavy intermittent soldering.

For complete information write Industrial Heating Division, General Electric Co., Schenectady, N.Y.; *or check no. 52 on the coupon.*

$3000 Model-Building Contest

Testor Chemical Co. announces a nationwide $3000 cash prize contest—open to all amateur model builders—for the best finished models of Testor's B-29 Super-Fortress. There are 119 awards to be given with a first prize of $1000.

The contest opens March 15, 1946, and entries must be postmarked not later than May 15. For full details of the contest write Testor Chemical Company, Rockford, Ill.; *or check no. 53 on the coupon.*

New Streamlined Saw-Gun

New, drastic improvements have been made in the exterior appearance and mechanical operation of the Saw-Gun, a portable power saw and file which is propelled by electricity, air, or flexible shaft. Ordinary hacksaw blade or file fits the holder.

For full details and prices write Mid-States Equipment Corporation (Saw-Gun Div.), 2533 E. 73rd St., Chicago 49, Ill.; *or check no. 54 on the coupon.*

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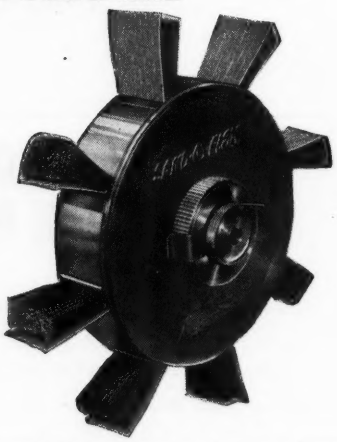

Sand-O-Flex, a new sander, is a low-cost tool that really reaches into recesses, around edges, and handles many of the jobs that were formerly done by hand. Bristle brushes cushion the abrasive cloth and force it down in and evenly over all wood and metal surfaces.

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An Outline of Aluminum is designed to acquaint workmen in industrial-training classes with aluminum and to give industrial-education, social-studies, and science classes correlated material on the metal. Sixty-four newly revised pages; profusely illustrated; includes questions in appendix to aid in the study of the outline. For copies for your classes, write Aluminum Company of America, Pittsburgh, Pa., *or check no. 56 on the coupon.*

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Instructional RESOURCES

Essential Vocational Mathematics. Ewing, Hart. Boston: D. C. Heath and Co., 1945. Pp. 266. $1.60.

This textbook presents a first-year course for vocational students and for those in technical high schools who are not preparing to enter college. The choice of the material was determined by a survey of the beginning mathematical needs of students in 22 vocational courses. In its presentation, adequate technical explanation of actual shop methods is given so that the students can understand the application of the mathematical problem to the work itself. Actual jobs of the vocational school shop have been used in the illustrative examples and the wide use of shop drawings in the problems stimulates active interest on the part of the student.

The text covers material from a review of arithmetic to and including trigonometry of the right angle. Arithmetic, geometry, algebra, and trigonometry are covered in such a manner as to give the vocational student a dependable foundation for the more specialized work of his chosen vocation.

Claude H. Ewing is supervisor of curriculum, Washburne Trade School, Chicago. Walter W. Hart is author of many mathematics texts.

Electric Circuits and Machines. Lister. New York: McGraw-Hill Book Co., 1945. Pp. xii + 358. $2.80.

This is a concise outline text of a brief course in fundamentals of electric circuits and machines which was recently offered in the specialized training program at Iowa State College.

Emphasis has been placed on fundamental principles and on the physical action that takes place rather than on detailed analysis of the involved theory. The treatment is as nonmathematical as practicable, the mathematics being limited largely to simple algebra. Many numerical examples are worked out in detail and a list of problems is included in those chapters in which the solution of problems will illustrate the applications of the principles involved.

The review questions at the end of each chapter may be used for class discussion or as a study aid.

Eugene C. Lister is now an electrical engineer with the Stanley Engineering Co. He was formerly supervisor of electrical theory instruction, STP, Iowa State College.

Wiley Trigonometric Tables. (Second Edition). New York: John Wiley & Sons, Inc., 1945. Pp. v + 117. $1.00.

In the preparation of the original edition of the *Wiley Trigonometric Tables*, three considerations were primary: to select the most appropriate tables, to make them as accurate as possible, and to arrange them in such order as to afford the maximum convenience to the user.

In addition to those customarily regarded as required in a trigonometry course, the Wiley tables include tables of powers and roots; S and T tables; and a set of frequently used constants. To the six original tables have been added four new tables in the second edition. These relate to haversines and mils.

An Educational Guide in Air Transportation. Hinkel, Baron. Kansas City, Mo.: Public Information Dept., Transcontinental & Western Air, Inc., 1945. Pp. 140. $0.75.

Prepared primarily for educators and students, this book will serve to acquaint the nation's youth with opportunities awaiting them in the field of aviation. It contains complete descriptions of the types of jobs available in commercial transport, together with vocational charts setting forth qualifications and salary ranges.

The book also contains a world map for the air age; describes how global war has swept man into a three-dimensional age of the air; how the plane has conquered entire nations; sets forth the limitless possibilities of aircraft as an instrument of peaceful commerce. In addition to an orientation course in air transportation, this educational guide also contains a complete bibliography on various aviation subjects.

R. E. Hinkel is TWA's educational supervisor; Leo Baron is general manager of the airline's public information department.

Design in the Industrial Arts. Bradley. Peoria, Illinois: The Manual Arts Press, 1946. Pp. 254. $3.00.

A new, highly practical analysis of handicraft and mass-production design. Taking into account traditional features of modern practice, the text is based entirely on present-day materials, methods, and tastes.

The "three-dimensional" elements which go into the work of the designer are fully outlined—the background of his trade: working and pictorial drawings, genuine knowledge of the problem (materials, processes, uses, eye appeal, etc.), and the essential tools and equipment needed for the production of the finished article.

The last half of the book features designing problems in typical fields of industrial arts. Illustrated with 171 examples of finished designs and processes.

Charles B. Bradley is director of art education, State Teachers College, Buffalo, New York.

New Motion Picture Index. A new index to Westinghouse motion pictures and slidefilms loaned free to schools except for transportation costs. Covers a wide range of subjects. The films described may be used in grades 7 through 12. Contains an index with recommendations as to the type of class for which each film is best suited and suggestions for related supplementary materials. A copy of the new index may be obtained through the School Service Department, Westinghouse Electric Corporation, 306 Fourth Avenue, Box 1017, Pittsburgh 30, Pennsylvania. *Please mention* SCHOOL SHOP.

Vocational Education in California. Although prepared primarily for California teachers by the state vocational education staff, the philosophy of vocational education presented will interest all vocational teachers. It makes clear the inter-relationships in vocational education and explores occupational trends which point new directions for vocational programs. A copy may be obtained from the California State Department of Education, Sacramento, California.

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From Washington *from page 34*

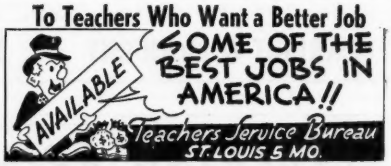
» The American *homo sapiens* has solved fairly effectively the question of getting food and clothing for himself; but shelter—in which to live and in which to learn—still seems to baffle him. All Washington agrees that meeting our housing and construction needs will be a critical issue for the next decade or even longer.

Take school construction as an example. Half the American school houses are outmoded and outworn for purposes of modern instruction. Seven billion dollars will be needed to replace these obsolete buildings with decent ones. Yet, in 1946 the total volume of all public construction (of which school building is only one phase) will not total more than 1.7 billion.

» Accidents — many of which have their origin in school shops—are today the leading cause of children's deaths. Science and medicine have reduced the numbet of deaths from pneumonia and TB, but carelessness is a much tougher enemy to conquer. The Children's Bureau says that 20,000 boys and girls die from accidents each year. Of this number, some 4,500 are accidents involving machinery or burns (excepting conflagration)—the very type which conceivably can take place in shop classes.

Washington safety officials are looking to school instructors for increased safety measures which would cut this toll. But they are looking for more: they hope for an inculcation of the safety habit in school shops which would subsequently help reduce an even greater toll in industry: namely, the 2,000,000 injuries and 16,000 deaths sustained during work in 1945.

To Teachers Who Want a Better Job



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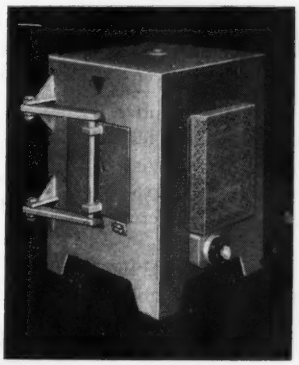

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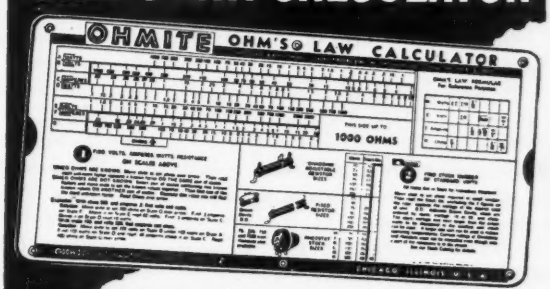

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Flash!

J. C. Wright, Assistant Commissioner for Vocational Education, U. S. Office of Education, announced at the Buffalo AVA meeting his successor who will take office next summer—R. W. Gregory who was in charge of the food-production training program for the USOE during the war and formerly taught at Purdue University.

FROM now on forward WAC will not designate women warriors but rather the War Assets Corporation — latest agency to assume control of surplus property disposal. Thus, WAC is heir to all the troubles that hitherto had plagued (1) the Treasury Department, (2) the Commerce Department, and (3) RFC, as they sought to sell surplus war goods.

WAC has apparently decided to do a more "slick" merchandising job than its predecessors. It is encouraging its regional and field offices to use display ads in newspapers, print illustrated leaflets, and use all the tricks of the advertisers' art.

That such pressure campaigns may be justified is indicated by the following figures. The government now has on hand 11 billion dollars worth of surplus; by June 1946, that figure will rise to 35 billion. But during the entire year of 1945, only 2½ billion dollars worth of surplus was sold.

Other major new development in surplus property is the growing movement now on in Congress to give priority No. 2, at present reserved for state and local governments, to veterans. The Senate Military Affairs Committee has already approved a bill which would take away the schools' priorities. If public, education, and other officials are not alert to this possibility, the veterans' pressure groups may well put over such a *coup*.

» For more than three generations, the U. S. Office of Education has carried on its work without benefit of lay advice and counsel. The decision of Commissioner of Education J. W. Studebaker to seek the guidance of a Citizens' Federal Committee on Education is therefore universally applauded. Dr. Studebaker himself did not name the committee. Instead, national organizations were asked to designate the persons they wanted to serve on such a committee. The final list of members includes leaders from agriculture, business, homemakers, labor, manufacturing, Negroes, the professions, religious and veterans groups.

Just how the "lay" designation fits the persons named is a question which might be pondered. Many of the individuals might be found on a dozen other "advisory committees" (example: National Grange Master Goss). Others have been in public so long as to forfeit the right to be called "lay persons" (example: AFL official Mathew Woll).

If more than window-dressing is wanted, should not some average tax-paying, child-bearing, school-supporting individuals be on that committee also?

» Practically unheard of a decade ago, "labor market" is today a term which seems destined to become part of the vocational-education language. Already Washington officials are using it glibly. Sample sentence: "You can't train in a vacuum; you always train youth and workers in terms of labor-market conditions."

"Labor market" is used in two senses: as a geographical area (the Philadelphia-Camden labor market); and as a phrase describing interplay of supply and demand for certain types of workers (the labor-market picture for welders).

Washington technicians are developing a body of facts on labor-market conditions, both by area and by industry or occupation. Officials insist that schools and colleges must have both types of facts before they can intelligently plan training programs, short or long range.

Hence, the U. S. Labor Department is now issuing statements on labor-market conditions, giving facts on an area's population, major industries, character of its labor force, and the outlook for employment. Some 140 major communities have been covered to date.

Industry statements (some 50 are already off the press) give the nature of occupations, the training and experience needed to get a job in a particular industry, and most important, the outlook for job-getting. Monthly "fill-ins" are issued by the Labor Department to keep facts current.

Young as this new field of knowledge is, it already boasts a national publication, entitled the *Labor Market*, which is available free to vocational and counseling officials.

Not only Washington but many local communities are active in supplying labor-market information to employers, veteran-advisor centers, and to schools. Reports to Washington show that some 500 local employment offices issue labor-market newsletters.

Whether valid or not, labor-market information is at least being seriously studied, as the number of vocational educators who ask for this information testify. *(Continued on page 32)*

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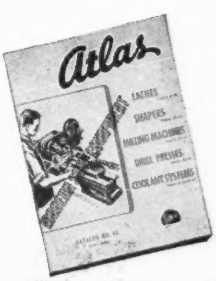

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